

Application No.: 10/810,638

REMARKS

This amendment is filed in response to the Office Action dated August 9, 2007. In view of these amendments and remarks, this application should be allowed and the case passed to issue. No new matter is introduced by this amendment. The amendments to claim 1 are supported by claims 9 and 10 and the specification at page 11, lines 21-23. The amendments to claim 11 are supported by claim 15 and the specification at page 11, lines 21-23. Claims 9, 10, and 15 are canceled in this response.

Claims 1-8, 10-14, and 16-20 are pending in this application. Claims 1-20 are rejected. Claims 1, 8, 11, 14, and 16 are amended in this response.

Claim Rejections Under 35 U.S.C. § 102

Claims 1-8, 11-14, and 18-20 were rejected under 35 U.S.C. § 102(b) as being anticipated by Ando et al. (U.S. Pat. No. 6,458,253). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested. The following is a comparison between the present invention, as claimed, and the cited prior art.

An aspect of this invention, per claim 1, is an apparatus adapted for treating or processing at least one substrate/workpiece in a plasma comprising a chamber defining an interior space and means for generating a plasma in the interior space of the chamber. Mounting means are adapted for positioning at least one substrate/workpiece in the interior space of the chamber for receiving treatment in the plasma. A gas supply means injects gas(es) into the interior space of the chamber comprising an inlet portion extending exteriorly of the chamber, an outlet extending into the chamber and including a pair of arcuately-shaped tubular gas outlet portions for injecting gas(es) into the interior space, and means for applying a bias potential to the gas supply means for suppressing plasma formation at the outlet portions. The means for applying a bias potential

Application No.: 10/810,638

is electrically isolated from the means for generating a plasma. The apparatus comprises a spaced-apart pair of cathode/target assemblies and the mounting means positions at least one substrate/workpiece in the space between the pair of cathode/target assemblies, and the arcuately-shaped tubular gas outlet portions are positioned between the spaced-apart pair of cathode/target assemblies.

Another aspect of the invention, per claim 11, is a method of treating or processing at least one substrate/workpiece in a plasma comprising steps of providing an apparatus comprising a chamber defining an interior space and including means for generating a plasma within the interior space. At least one substrate/workpiece is mounted or positioned in between a spaced-apart pair of cathode/target assemblies in the interior space of the chamber. Gas(es) are injected between the spaced-apart pair of cathode/target assemblies by means of an electrically isolated gas supply means having a pair of arcuately-shaped tubular gas outlet portions. A plasma is generated in the interior space of the chamber via the means for generating a plasma. A bias potential is applied to supply means to suppress plasma formation at the outlet portions, and the at least one substrate/workpiece is treated or processed in the plasma. The gas supply means is electrically isolated from the means for generating a plasma.

Ando et al. do not anticipate the claimed apparatus adapted for treating or processing at least one substrate/workpiece in a plasma and method of treating or processing at least one substrate/workpiece in a plasma. Ando et al. do not disclose a gas supply means for injecting gas(es) into the interior space of said chamber comprising an outlet portion extending into the chamber and including a pair of arcuately-shaped tubular gas outlet portions for injecting gas(cs) into the interior space, and a spaced-apart pair of cathode/target assemblies and said mounting means positions at least one substrate/workpiece in the space between said pair of cathode/target

Application No.: 10/810,638

assemblies, and the arcuately-shaped tubular gas outlet portions are positioned between the spaced-apart pair of cathode/target assemblies, as required by claim 1; and the steps of mounting/positioning at least one substrate/workpiece between a spaced-apart pair of cathode/target assemblies in the interior space of the chamber, and injecting gas(es) between the spaced-apart pair of cathode/target assemblies by means of an electrically isolated gas supply means having a pair of arcuately-shaped tubular gas outlet portions, as required by claim 11.

As disclosed in the present specification, the present invention suppresses the premature ionization of inert gases (plasma formation), the erosion of the gas delivery system, and the creation of the decomposed species adjacent the gas delivery system (page 10, lines 4-26).

The factual determination of lack of novelty under 35 U.S.C. § 102 requires the disclosure in a single reference of each element of a claimed invention. *Helifix Ltd. v. Blok-Lok Ltd.*, 208 F.3d 1339, 54 USPQ2d 1299 (Fed. Cir. 2000); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *Hoover Group, Inc. v. Custom Metalcraft, Inc.*, 66 F.3d 399, 36 USPQ2d 1101 (Fed. Cir. 1995); *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051 (Fed. Cir. 1987). Because Ando et al. do not disclose a gas supply means for injecting gas(es) into the interior space of the chamber comprising an outlet extending into the chamber and including a pair of arcuately-shaped tubular gas outlet portions for injecting gas(es) into the interior space, and a spaced-apart pair of cathode/target assemblies and the mounting means positions at least one substrate/workpiece in the space between the pair of cathode/target assemblies, and the arcuately-shaped tubular gas outlet portions are positioned between the spaced-apart pair of cathode/target assemblies, as required by claim 1; and the steps of

Application No.: 10/810,638

mounting/positioning at least one substrate/workpiece between a spaced-apart pair of cathode/target assemblies in the interior space of the chamber, and injecting gas(es) between the spaced-apart pair of cathode/target assemblies by means of an electrically isolated gas supply means having a pair of arcuately-shaped tubular gas outlet portions, as required by claim 11, Ando et al. do not anticipate claims 1 and 11.

Applicant further submits that Ando et al. do not suggest the claimed apparatus adapted for treating or processing at least one substrate/workpiece in a plasma and method of treating or processing at least one substrate/workpiece in a plasma.

Claim Rejections Under 35 U.S.C. § 103

Claims 9, 10, 15, and 16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ando et al. in view of Zejda (U.S. Pat. No. 5,228,968). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

The Examiner acknowledged that Ando et al. do not disclose the claimed spaced-apart pair of cathode/target assemblies, mounting means, and gas supply means. The Examiner relied on the teachings of Zejda to provide these elements and asserted that it would have been obvious to combine Zejda with Ando et al.

The combination of Ando et al. and Zejda, however, does not suggest the claimed apparatus and method because Zejda does not cure the deficiencies of Ando et al. Zejda does not suggest a gas supply means for injecting gas(es) into the interior space of the chamber comprising an outlet extending into the chamber and including a pair of arcuately-shaped tubular gas outlet portions for injecting gas(es) into the interior space, and the arcuately-shaped tubular gas outlet portions are positioned between the spaced-apart pair of cathode/target assemblies, as required by claim 1; and the step of injecting gas(es) between the spaced-apart pair of

Application No.: 10/810,638

cathode/target assemblies by means of an electrically isolated gas supply means having a pair of arcuately-shaped tubular gas outlet portions, as required by claim 11.

The present apparatus and method are further distinguishable over the combination of Ando et al. and Zejda in view of the very different structures of the Ando et al. and Zejda apparatuses. It would not have been obvious to one of ordinary skill in this art to modify the Ando et al. apparatus into a configuration disclosed by Zejda. Modifying the Ando et al. apparatus into the Zejda configuration, even if it was obvious to do so, and Applicant maintains it is not, would significantly alter the functionality of the Ando et al. apparatus. For example, as shown in Fig. 7, the targets (13) of Ando et al. do not face the substrate and a shutter (17) is between the anode (71) with the substrate (70) and the cathode. It is not seen how Zejda could be combined with Ando et al. and still retain the benefits and features of Ando et al. In Zejda the cathodes (6, 7) face the substrate (11). If Zejda is combined with Ando et al. to provide the pair of cathode/target assemblies and injecting a gas into the space between the pair of cathode/target assemblies, the cathode/target assemblies would directly face the substrate and the benefits of the shutter would be lost. Furthermore, it is not seen how an arcuately-shaped gas outlet portion could be provided by incorporating the gas flow arrangement of Zejda into the Ando et al. apparatus.

Claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Ando et al. in view of Zejda and further in view of Suzuki et al. (U.S. Pat. No. 6,627,253). This rejection is traversed, and reconsideration and withdrawal thereof respectfully requested.

The Examiner acknowledged that Ando et al. and Zejda do not disclose the claimed reactive sputtering of a ferromagnetic target material in an oxygen-containing plasma. The

Application No.: 10/810,638

Examiner relied on the teachings of Suzuki et al. to provide this step and asserted that it would have been obvious to combine Suzuki et al. with Zejda and Ando et al.

The combination of Suzuki et al. with Ando et al. and Zejda, however, does not suggest the claimed apparatus and method because Suzuki et al. do not cure the deficiencies of Ando et al. and Zejda. Suzuki et al. do not suggest a gas supply means for injecting gas(es) into the interior space of the chamber comprising an outlet extending into the chamber and including a pair of arcuately-shaped tubular gas outlet portions for injecting gas(es) into the interior space, and a spaced-apart pair of cathode/target assemblies and the mounting means positions at least one substrate/workpiece in the space between said pair of cathode/target assemblies, and the arcuately-shaped tubular gas outlet portions are positioned between the spaced-apart pair of cathode/target assemblies, as required by claim 1; and the steps of mounting/positioning at least one substrate/workpiece between a spaced-apart pair of cathode/target assemblies in the interior space of the chamber, and injecting gas(es) between the spaced-apart pair of cathode/target assemblies by means of an electrically isolated gas supply means having a pair of arcuately-shaped tubular gas outlet portions, as required by claim 11.

The dependent claims are allowable for at least the same reasons as the independent claims from which they depend and further distinguish the claimed apparatus and method.

In view of the above remarks, Applicant submits that this application should be allowed and the case passed to issue. If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

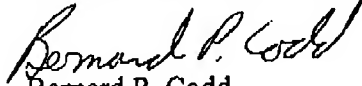
To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper,

Application No.: 10/810,638

including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

McDERMOTT WILL & EMERY LLP



Bernard P. Codd

Registration No. 46,429

600 13th Street, N.W.
Washington, DC 20005-3096
Phone: 202.756.8000 BPC:kap
Facsimile: 202.756.8087
Date: December 10, 2007

**Please recognize our Customer No. 49745
as our correspondence address.**

Certification of Facsimile Transmission

I hereby certify that this paper is being facsimile transmitted to the Patent and Trademark Office on the date shown below

Kim Pollard
Type or print name of person signing certification

Kim Pollard 12/10/07
Signature Date